Smart Mobility @Ames

NASA Smart Mobility at Ames
17 Feb 2023

Smart Mobility@Ames Overview

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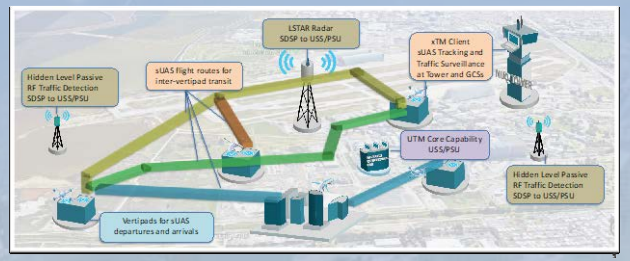
Vision for an Integrated Range Infrastructure at NASA Ames

Smart Urban Integrated Test Environment (SUITE)

Scalable eVTOL Flight Test Network

Linked eVTOL Routes to a Vertiport



Persistent USS/PSU-enabled Flight Network

Outdoor Aerodynamics Research Facility

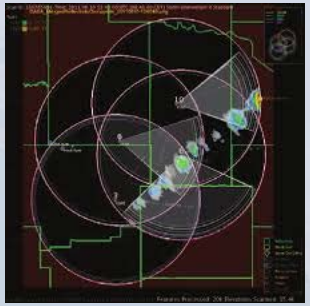
Instrumented Smart Vertipads

-Micro wind
-Contact pressure
-LIDAR
-SODAR
-Optical

FAA-approved UAM Flight Corridors

Instrumentation & Control

Active and Passive Sensor Network



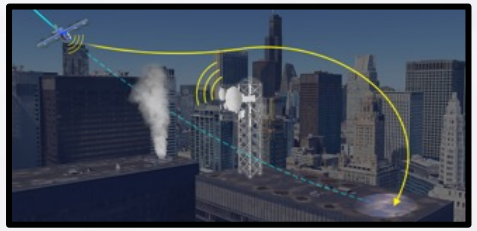
ADS-B

Persistent Secure Network

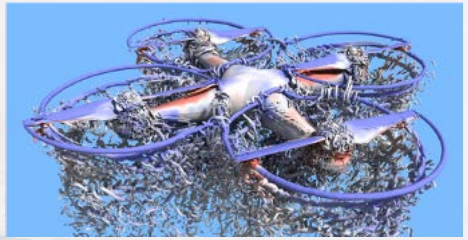
AAM SUITE Visualization Lab

Modeling & Simulation

Synthetic Urban Overlays



CFD-enabled eVTOL Rotor Flows



eVTOL Simulation

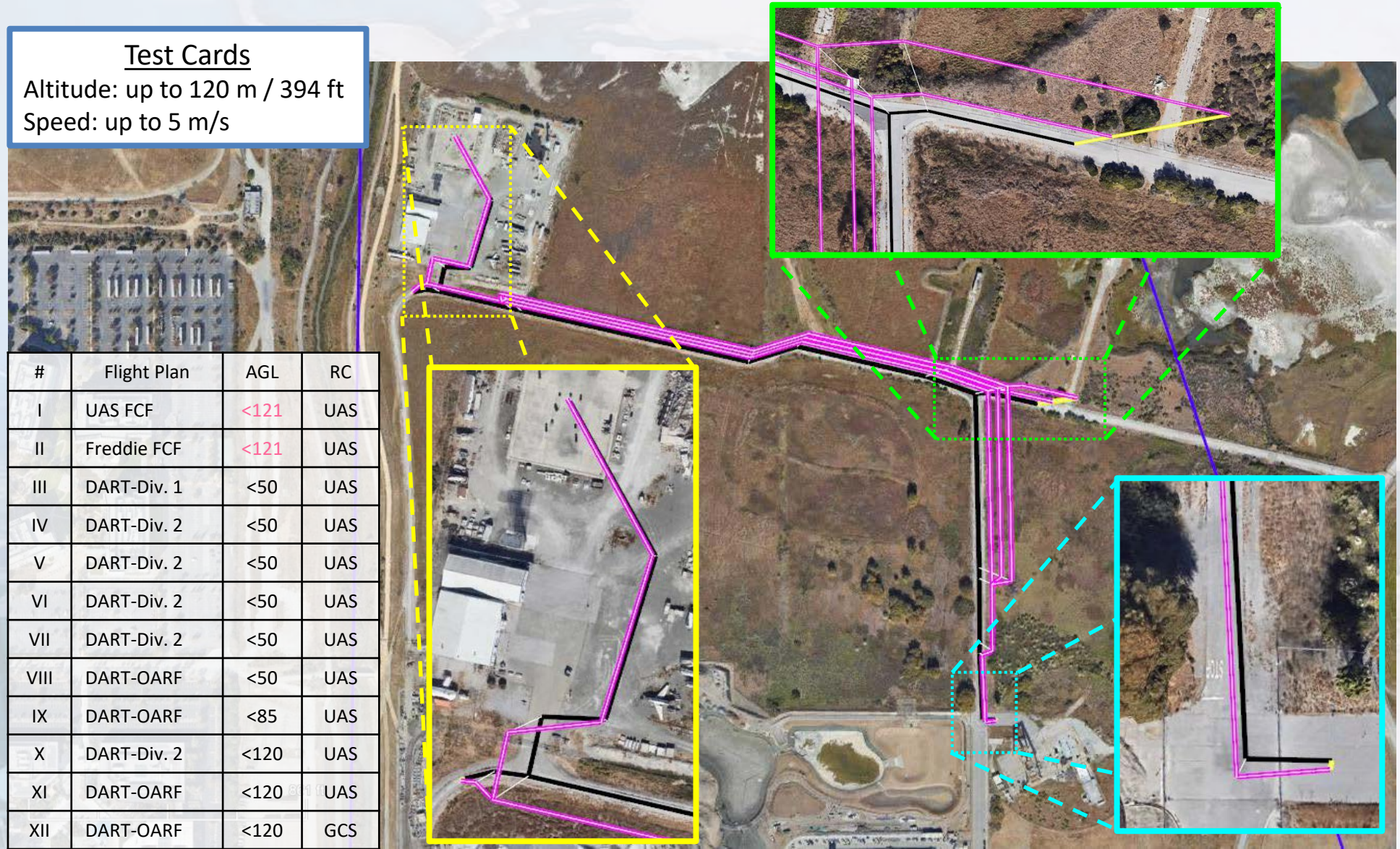
SUITE Build 1.0 CONOPS

Operate a single sUAS from point-t-point, connected to Federal USS, integrated ground-based sensor supporting

SUITE Build 1.0 Test Cards

Test Cards
Altitude: up to 120 m / 394 ft
Speed: up to 5 m/s

#	Flight Plan	AGL	RC
I	UAS FCF	<121	UAS
II	Freddie FCF	<121	UAS
III	DART-Div. 1	<50	UAS
IV	DART-Div. 2	<50	UAS
V	DART-Div. 2	<50	UAS
VI	DART-Div. 2	<50	UAS
VII	DART-Div. 2	<50	UAS
VIII	DART-OARF	<50	UAS
IX	DART-OARF	<85	UAS
X	DART-Div. 2	<120	UAS
XI	DART-OARF	<120	UAS
XII	DART-OARF	<120	GCS



SUITE Build 2.X - Integrated Airfield Operations

Operate multiple sUAS from multiple sites on KNUQ, concurrent airfield manned flight activities

SUITE Build 3.1

Unmanned flight operations between KNUQ and KPAO, BVLOS enabled by GBSAA and Federal PSU

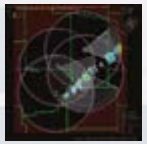
Vertiplex Instrumentation Requirements

Communication:

- Mobile Cellular Network / Fiber
- V2X / C-V2X Radios

Navigation:

- Localization: (e.g. NextNav)
- Global Solution: DGPS or RTK



Surveillance:

- Primary: LSTAR Radar + HL1000
- Secondary: ADS-B

Information:

- Weather: AWOS, LIDAR, SODAR, etc.
- RF Monitoring
- Obstacle / Terrain Data
- Terminal Procedures

Vertipad Instrumentation Requirements

- Contact Pressure Sensing Vertipad
- Vertipad Video Surveillance (360 degree)
- Microphone Array
- Lighting and Markings
- Battery Charging Stations (TBD capability)
- Raised Platform Vertipad (TBD capability)

QUESTIONS & NEXT STEPS